



901 S Division  
Pinehurst, ID 83850  
Office 208/682-9190  
Fax 208/682-2737  
[www.ferguson-contracting.com](http://www.ferguson-contracting.com)

## BHCTP Monthly Discharge Monitoring Report

Month: April-18

Facility: Central Treatment Plant

Location: Bunker Hill Superfund Site

Contract Number: W912DW-16-C-0012 Amec Foster Wheeler

Total Flow For The Month From 006 Outfall: 70,249,030 gallons estimated

Sludge pumping to CIA sludge pond: 1,953,000 gallons estimated

Total Flow From Kellogg Tunnel: 68,907,980 gallons

Percent of Influent Successfully Treated: 100.0%

13 sample days \* 6 parameters (Pb, Cd, Zn, Mn, TSS & pH) = 78 potential exceedances  
**78 - 0 exceedances = 78 78/78 = 100%**

### Results of Sampling Efforts:

All sampling has been performed in accordance with specifications and the Sampling and Analysis Plan.

Performance Evaluation (PE) sampling was not performed for this reporting period.

Trip blank and rinsate sampling was performed, with the results being reported on the 'PTM-004,RB,TB' page of this DMR.

### Highlights of Plant Maintenance and/or Plant Optimization:

**04-01-18** Performed monthly fire extinguisher inspection. All CTP fire extinguishers are fully charged and in good working condition at this time.

**04-01-18** Performed monthly pump and motor inspection. All CTP pumps and motors are in good condition at this time.

**04-02-18 00:10** Operators responded to an auto-dialer alarm caused by the lime system sump high level. The lime system sump pump failed to draw down the lime system sump as needed. Operators manually pumped the sump upon arrival. The sump pump will be removed and inspected during normal working shift. Operators removed the lime system sump pump, cleaned the pump inlet, tested the pump and placed it back into service. No addition issues to report. The sump pump is again in good working condition.

**04-04-18** Operators removed the lime system sump pump. The sump pump was dismantled and all components were cleaned and inspected. No damaged parts were found. All components were found in good condition. Operators assembled the components using new seals and gaskets. The pump was tested and placed back into service. The discharge rate of the pump was tested at approximately 10 gpm at this time.

**Note:** 10 gpm discharge from the lime system sump is not adequate to control upsets or overflows of the lime slaking process. The lime slaking process is operated at a rate of 70 gpm under normal operations.

**04-10-18** Operators performed the monthly no load emergency generator run test. The emergency generator operated for one half hour as programmed with no issues or errors to report.

**04-18-18** Operators drained and cleaned the flocculant mixing tank to remove the collected debris. Flocculant mixing tank is now ready for increased use during the projected spring run off.

**04-19-18** Verified the old mine line discharge flow at the lined storage pond. Flow at this time is 20 gpm.

**04-23-18** Reviewed the Sludge Pond Capacity memorandum developed by AFW. The CTP operating staff found no known discrepancies within the memo. The sludge tracking sheet attached has been revised to note the elevations noted in the memorandum.

**04-24-18** Operators performed the monthly full load emergency generator run test. The emergency generator operated all CTP components for one hour as programmed with no issues or errors to report.

**04-24-18** During an attempted lined storage pond pumping event the #1 lined pond pump failed to run. The #2 and #3 pumps were placed into service. Operators investigated and found the #1 drive motor separated from the pump unit. The pump unit is apparently seized. The drive motor and associated valves have been locked and tagged out. The entire unit has been de-energized and removed from service. The OMER manager and AFW management has been notified.

**04-30-18** Operators decreased the lime slurry dilution water from 20 gpm to 13 gpm to increase the lime solids. The lime slurry solids are being increased as the lime injection valve open time is near alarm levels.

**04-30-18** Performed monthly reset of the KT and treated outfall flow meters. Documented monthly totals on the KT & 006 flow page of this report.

- The Kellogg Tunnel discharge flow increased by 20% from April 2017, from 61.9 mg to 74.1 mg.
- The Kellogg Tunnel zinc concentration decreased by 55% from April 2017, from an average of 238 mg/L to 107 mg/L.
- The CTP operating pH set point was increased from 8.4 to 8.5 during Lined Storage Pond pumping and KT low flow events this reportir
- The flocculent dosage was increased from approximately 1.4 PPM to 2.0 PPM during lined storage pond pumping events.
- The CTP sludge recycle rate remained at 400 gpm.
- CTP operators received one off-shift auto dialer call-out alarm caused by the lime system sump high level as noted 04-02-18.
- CTP operators performed four pumping events from the Lined Storage Pond.
- CTP operators verified Aeration Basin pH probe and grab sample values twice per day.

Lessons Learned:

No significant lessons learned during this reporting period.

MONITORING PERIOD						
YEAR	MO	DAY		YEAR	MO	DAY
2018	4	1		2018	4	30

PARAMETER		Quantity or Loading			Quality or Concentration				FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MONTHLY AVERAGE	DAILY MAXIMUM	UNITS	MINIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	UNITS		
pH	Sample Measurement				6.50		7.00		Continuous	Meter
	Permit Required				6.0		10.0			
Flow Thru Treatment Plant	Sample Measurement	2.34	3.08	mgd						
	Permit Required		Daily							
Lead Total - Pb Effluent	Sample Measurement	0.06	0.14	lbs/day		0.003	0.006	mg/L	three samples/ week	Comp 24
	Permit Required	14.8	37.0			0.30	0.60	mg/L		
Zinc Total - Zn Effluent	Sample Measurement	4.38	7.92	lbs/day		0.24	0.34	mg/L	three samples/ week	Comp 24
	Permit Required	36.2	91.3			0.73	1.48	mg/L		
Cadmium - Cd Effluent	Sample Measurement	0.04	0.162	lbs/day		0.002	0.008	mg/L	three samples/ week	Comp 24
	Permit Required	2.40	6.10			0.050	0.100	mg/L		
Manganese - Mn Effluent	Sample Measurement	291	467	lbs/day		13.8	24.1	mg/L	three samples/ week	Comp 24
	No Permit Required					N/A	N/A	mg/L		
Total Suspended Solids - TSS	Sample Measurement	26.1	57	lbs/day		1.4	2.2	mg/L	three samples/ week	Comp 24
	Permit Required	985	1907			20	30	mg/L		

PREPARED BY: GARY FULTON

REVIEWED BY: BRIAN JOHNSON

**NPDES DISCHARGE POINT 006  
CENTRAL TREATMENT PLANT  
MONTH: Apr-18**

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	FLOW	TSS		LOADING
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day		mgd	mg/L	lbs/day	kg/day
1		0.053		4.84		0.02		452		2.52		8.41	3.81
2	0.003	0.053	0.230	4.84	0.001	0.02	21.5	452	6.90	2.52	0.4	8.41	3.81
3		0.050		4.56		0.02		426		2.38		7.93	3.60
4	0.003	0.048	0.212	4.11	0.001	0.02	24.1	467	7.00	2.32	2.0	38.8	17.6
5		0.048		4.11		0.02		467		2.32		38.8	17.6
6	0.003	0.048	0.222	4.24	0.001	0.02	23.4	447	7.00	2.29	1.2	22.9	10.4
7		0.033		2.89		0.01		305		1.56		15.6	7.08
8		0.021		1.86		0.01		196		1.01		10.1	4.57
9	0.003	0.022	0.327	2.88	0.001	0.01	6.96	61.3	7.00	1.06	1.4	12.3	5.59
10		0.030		3.92		0.01		83.5		1.44		16.8	7.61
11	0.003	0.059	0.338	7.92	0.001	0.02	4.45	104	6.90	2.81	1.4	32.8	14.9
12		0.055		7.38		0.02		97.2		2.62		30.6	13.9
13	0.003	0.056	0.226	5.08	0.001	0.02	15.2	342	6.70	2.70	1.6	36.0	16.3
14		0.057		5.14		0.02		346		2.73		36.4	16.5
15		0.054		4.85		0.02		326		2.57		34.3	15.6
16	0.004	0.095	0.207	4.66	0.001	0.02	19.4	437	6.90	2.70	1.8	40.6	18.4
17		0.096		4.71		0.02		441		2.73		41.0	18.6
18	0.003	0.055	0.196	4.33	0.005	0.10	14.9	329	6.80	2.65	1.0	22.1	10.0
19		0.059		4.63		0.11		352		2.83		23.6	10.7
20	0.006	0.137	0.198	4.76	0.001	0.02	15.3	368	6.50	2.88	1.2	28.8	13.1
21		0.141		4.91		0.02		379		2.97		29.7	13.5
22		0.130		4.50		0.02		348		2.73		27.3	12.4
23	0.003	0.058	0.201	4.64	0.002	0.05	13.0	300	6.90	2.77	0.6	13.8	6.28
24		0.059		4.76		0.05		308		2.84		14.2	6.45
25	0.003	0.064	0.191	4.91	0.006	0.16	9.55	245	6.90	3.08	2.2	56.5	25.6
26		0.058		4.42		0.15		221		2.77		50.9	23.1
27	0.005	0.077	0.189	2.98	0.001	0.01	9.20	145	6.70	1.89	1.6	25.2	11.4
28		0.080		3.08		0.01		150		1.95		26.0	11.8
29		0.055		2.11		0.01		102		1.34		17.8	8.08
30	0.003	0.028	0.318	3.50	0.008	0.09	2.53	27.9	6.70	1.32	1.4	15.4	6.99
Total	0.040	1.875	3.055	131.505	0.028	1.056	179.490	8725.773	88.900	70.25	17.800	783.113	355.153
Sample Events	13	30	13	30	13	30	13	30	13	30	13	30	30
Daily Average	0.003	0.063	0.235	4.38	0.002	0.035	13.8	291	6.84	2.34	1.37	26.1	11.84
Lab Detection Limit	0.0025		0.003		0.0008		0.0017		0.01		0.080		

MIN	0.003	0.021	0.189	1.864	0.001	0.007	2.530	27.869	6.500	1.006	0.400	7.931	3.597
MAX	0.006	0.141	0.338	7.919	0.008	0.162	24.100	466.988	7.000	3.079	2.200	56.527	25.636

Notes:  
 $(X \text{ mg/L}) * (1 \text{ kg}/10^6 \text{ mg}) * (2.205 \text{ lbs/kg}) * (3.785 \text{ L/gal}) * (10^6 \text{ gal/Mgal}) * (Y \text{ Mgal/day}) = (X) * (Y) * (8.345) \text{ in lbs/day}$   
 $(X \text{ lbs/day}) * (1 \text{ kg}/2.205 \text{ lbs}) = (X) / (2.205) \text{ in kg/day}$

verified by Kestin Schulz 05/15/18

**KELLOGG TUNNEL DISCHARGE  
CENTRAL TREATMENT PLANT  
MONTH: Apr-18  
Data from SVL**

DAY	LEAD (Pb)		ZINC (Zn)		CADMIUM (Cd)		MANGANESE (Mn)		pH	006 FLOW		TSS	
	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day	mg/L	lbs/day		mgd	mg/L	lbs/day	kg/day
1		13.88		1,632		2.80		2,103		2.52		2,103	954
2	0.660	13.88	78	1,632	0.133	2.80	100	2,103	3.10	2.52	100	2,103	954
3		13.09		1,539		2.64		1,983		2.38		1,983	899
4		12.79		1,504		2.58		1,938		2.32		1,938	879
5	0.750	14.53	78	1,506	0.138	2.67	100	1,936	3.10	2.32	125	2,422	1,098
6		14.31		1,483		2.63		1,907		2.29		2,386	1,082
7		9.76		1,012		1.80		1,301		1.56		1,627	738
8		6.30		652		1.16		839		1.01		1,050	476
9	0.883	7.77	108	951	0.239	2.10	32	285	2.80	1.06	27	238	108
10		10.59		1,295		2.87		389		1.44		324	147
11		20.69		2,530		5.60		759		2.81		633	287
12	0.887	19.38	82	1,798	0.149	3.26	85	1,861	3.00	2.62	127	2,775	1,258
13		19.95		1,851		3.35		1,916		2.70		2,856	1,295
14		20.19		1,873		3.39		1,939		2.73		2,890	1,311
15		19.02		1,765		3.20		1,827		2.57		2,723	1,235
16	0.818	18.43	48	1,075	0.176	3.97	47	1,050	3.00	2.70	90	2,028	920
17		18.62		1,086		4.01		1,060		2.73		2,048	929
18		18.06		1,053		3.89		1,029		2.65		1,987	901
19	1.150	27.16	53	1,242	0.206	4.86	48	1,129	3.00	2.83	124	2,928	1,328
20		27.64		1,264		4.95		1,149		2.88		2,980	1,352
21		28.50		1,304		5.11		1,185		2.97		3,073	1,394
22		26.15		1,196		4.68		1,087		2.73		2,820	1,279
23	0.727	16.77	112	2,584	0.261	6.02	91	2,088	2.90	2.77	108	2,492	1,130
24		17.23		2,654		6.19		2,145		2.84		2,560	1,161
25		18.68		2,878		6.71		2,325		3.08		2,775	1,258
26	0.791	18.28	114	2,635	0.277	6.40	88	2,041	2.90	2.77	127	2,936	1,331
27		12.48		1,798		4.37		1,393		1.89		2,003	908
28		12.87		1,855		4.51		1,437		1.95		2,067	937
29		8.81		1,270		3.09		984		1.34		1,415	642
30	0.781	8.60	295	3,250	0.819	9.02	69	759	2.70	1.32	21	231	105
Total	7.45	494.41	966.90	50165.24	2.40	120.60	659.60	43944.62	26.50	70.25	849.00	62391.98	28295.68
Sample Events	9	30	9	30	9	30	9	30	9	30	9	30	30
Daily Average	0.827	16.5	107.4	1,672	0.266	4.02	73.3	1,465	2.94	2.34	94	2080	943

Notes:

$(X \text{ mg/L}) * (1 \text{ kg}/10^6 \text{ mg}) * (2.205 \text{ lbs/kg}) * (3.785 \text{ L/gal}) * (10^6 \text{ gal/Mgal}) * (Y \text{ Mgal/day}) = (X) * (Y) * (8.345) \text{ lbs/day}$

$(X \text{ lbs/day}) * (1 \text{ kg}/2.205 \text{ lbs}) = (X) / (2.205) \text{ kg/day}$

verified by Kestin Schulz 05/15/18

**PTM Effluent at Lined Storage Pond  
CENTRAL TREATMENT PLANT**

**Month: Apr-18**

<b>DATE</b>	<b>LEAD mg/L</b>	<b>ZINC mg/L</b>	<b>CADMIUM mg/L</b>	<b>pH s.u. CTP Lab</b>	<b>TSS mg/L</b>
04/05/18	0.0135	9.7	1.02	7.40	0.0
04/19/18	0.0232	11.0	1.11	7.30	0.8

**RINSATE AND TRIP BLANKS  
CENTRAL TREATMENT PLANT**

**Month: Apr-18**

**Rinsate and Trip Blank samples will be taken approximately every 20  
QC events, or one each per month.**

<b>LOCATION</b>	<b>DATE</b>	<b>SAMPLE</b>	<b>LEAD mg/L</b>	<b>ZINC mg/L</b>	<b>CADMIUM mg/L</b>
<b>Rinsate &amp; Trip Blank</b>					
Kellogg tunnel Discharge		RB-04-04-18	<0.008	<0.010	<0.002
Trip Blank (D.I.water)		TB-04-04-18	<0.008	<0.010	<0.002

*verified by Kestin Schulz 05/15/18*

Bunker Hill Central Treatment Plant

Daily log April 2018

				AERATION BASIN				CLARIFIER				CLARIFIER TROUGH -for- DISCHARGE 006										RECYCLE SG		LIME SLURRY			SLUDGE PUMP		POND PUMP		SLUDGE GUN TEST		LINED POND				
		INFLUENT KT			a.m.	p.m.		a.m.	p.m.					pH	a.m.	pH	p.m.	Turbidity	Est	DO	1/wk					Injection Valve	Est.	600gpm						ESTIMATED			
DATE	Operators	GPM	pH	SET	pH1	grab	pH1	grab	pH2	grab	pH2	grab	TURB	TEMP	Mtr	grab	Mtr	grab	Meter	Grab	Flow	PPM	TEMP	SG	GPM	SG	%solid	Closed/Open	pump #	min	ON	OFF	10' Out	20' Out	Elevation (mg)		
4/1	SB			8.4	8.4	8.5	8.4	8.4	7.7	8.1	7.9	8.0	1.05	48	8.1	7.8	8.1	8.1	1.90	1.15	2.52			1.057	400	1.066	10.2	154/35	3	120					2268.5 (0.75mg)		
4/2	GF,SB	1800	2.70	8.4	8.4	8.4	8.3	8.3	7.7	8.0	7.9	7.9	1.00	48	8.2	8.0	8.1	7.8	2.20	1.10	2.52			1.057	400	1.066	10.2	148/35	3	120					2269.0 (1.0 mg)		
4/3	GF,SB,GC			8.4	8.4	8.4	8.4	8.4	7.7	8.2	7.9	8.1	1.02	48	8.0	8.2	8.2	8.0	2.00	1.23	2.38			1.053	400	1.067	10.4	165/35	3	90			16"	13"	2269.0		
4/4	GF,SB,GC			8.4	8.4	8.4	8.4	8.4	7.8	8.0	7.8	7.9	1.30	50	8.0	7.8	8.0	8.0	2.20	1.25	2.32	9.5	10.0c	1.053	400	1.067	10.4	162/35	3	120					2269.0		
4/5	GF,SB,GC	1690	2.59	8.4	8.4	8.5	8.5	8.5	7.7	8.2	7.9	8.0	1.42	49	8.4	8.1	8.1	8.1	2.30	1.48	2.32			1.059	400	1.067	10.4	165/35	3	120					2269.0		
4/6	GF,GC			8.4	8.4	8.4	8.4	8.4	7.8	8.0	7.9	8.1	1.20	50	8.1	7.9	8.0	8.0	1.30	1.39	2.29			1.060	400	1.069	10.7	164/35	3	120					2269.0		
4/7	GC			8.5	8.4	8.4	8.5	8.5	7.5	8.1	7.6	7.9	1.02	49	8.0	8.0	7.8	8.0	0.90	1.04	1.56			1.038	400	1.068	10.5	230/35	3	30					2269.0		
4/8	SB			8.5	8.5	8.6	8.6	8.6	7.6	8.1	7.8	8.1	1.05	47	7.6	8.1	8.0	8.1	0.20	0.90	1.01			1.045	400	1.066	10.2	225/25	3	65					2269.0		
4/9	GF,SB	1075	2.44	8.5	8.6	8.5	8.5	8.5	7.8	8.0	7.9	8.1	0.70	48	7.8	8.0	8.0	8.1	0.00	0.90	1.06			1.048	400	1.067	10.4	221/25	3	75					2269.5 (1.25 mg)		
4/10	GF,SB,GC			8.5	8.5	8.6	8.5	8.4	7.8	8.0	7.9	8.0	0.53	45	8.1	8.1	8.0	8.0	0.70	0.60	1.44			1.040	400	1.065	10.1	219/25	3	120	#3-06:45	11:30			2269.5		
4/11	GF,SB,GC			8.4	8.4	8.5	8.5	8.3	7.7	7.9	7.8	8.0	0.66	47	8.0	8.1	8.0	7.9	0.70	0.64	2.81	9.5	9.6c	1.048	400	1.066	10.2	149/35	3	120					2269.5		
4/12	GF,SB,GC	1972	2.37	8.4	8.4	8.5	8.4	8.4	7.5	8.1	7.8	8.2	0.84	50	8.0	8.0	8.0	8.1	0.80	0.73	2.62			1.055	400	1.067	10.4	135/35	3	120					2270.0 (1.5mg)		
4/13	GF,SB			8.4	8.4	8.4	8.4	8.4	7.7	7.9	7.8	8.2	0.90	52	7.9	7.8	8.0	8.1	0.90	0.95	2.70			1.057	400	1.066	10.2	132/35	3	120					2270.0		
4/14	GC			8.4	8.4	8.5	8.4	8.4	7.5	7.5	7.7	7.7	1.14	54	8.0	7.8	8.0	7.9	1.00	1.19	2.73			1.055	400	1.066	10.2	135/35	3	120					2270.0		
4/15	SB			8.4	8.4	8.4	8.4	8.3	7.5	7.7	7.7	7.9	1.13	51	8.0	7.8	8.0	7.9	1.10	1.17	2.57			1.053	400	1.066	10.2	130/35	3	120					2270.5 (1.87mg)		
4/16	SB	1993	2.32	8.4	8.4	8.5	8.5	8.4	7.5	7.9	7.7	7.9	1.12	50	8.0	7.9	8.0	7.9	1.10	1.05	2.70			1.054	400	1.066	10.2	119/36	3	120					2270.5		
4/17	GF,SB,GC			8.5	8.4	8.3	8.6	8.5	7.6	8.0	8.3	8.0	1.18	50	8.0	7.8	8.1	8.0	1.10	1.25	2.73			1.056	400	1.065	10.1	120/36	3	120	#3-10:50	13:00			2270.5		
4/18	GF,SB,GC			8.4	8.4	8.4	8.5	8.5	8.2	8.1	8.0	7.9	0.90	51	8.1	8.0	8.1	7.7	1.00	1.04	2.65	9.30	8.9c	1.054	400	1.066	10.2	116/36	3	120			8"	7"	2270.5		
4/19	GF,SB,GC	2000	2.68	8.4	8.4	8.5	8.4	8.4	7.9	7.9	7.9	8.0	1.23	52	7.9	7.9	8.0	7.9	0.90	1.16	2.83			1.051	400	1.071	11.0	121/36	3	120					2270.5		
4/20	GF,GC			8.4	8.4	8.4	8.4	8.4	8.0	8.0	7.9	7.9	1.00	53	7.9	8.0	7.9	7.8	1.10	1.08	2.88			1.056	400	1.070	10.8	115/36	3	120					2270.5		
4/21	GC			8.4	8.4	8.4	8.4	8.4	8.0	8.0	7.9	7.9	0.95	54	7.9	7.7	7.8	7.8	1.10	0.89	2.97			1.055	400	1.077	11.9	126/36	3	120					2270.5		
4/22	SB			8.4	8.4	8.4	8.4	8.4	7.9	7.8	7.8	7.9	0.94	47	7.9	7.9	7.9	7.9	1.00	0.88	2.73			1.051	400	1.075	11.6	121/36	3	120					2270.5		
4/23	GF,SB	2007	2.68	8.4	8.4	8.4	8.4	8.4	7.9	8.0	7.9	8.0	1.00	52	7.9	7.8	7.9	7.9	1.00	1.10	2.77			1.050	400	1.076	11.7	122/36	3	120					2271.0 (2.25mg)		
4/24	GF,SB,GC			8.5	8.4	8.5	8.6	8.5	8.2	8.0	8.5	8.4	1.16	48	7.9	7.9	8.2	8.3	1.10	1.08	2.84			1.051	400	1.074	11.4	112/36	3	185	#3&1) 06:15 - 13:15				2271.0		
4/25	GF,SB,GC			8.4	8.4	8.4	8.3	8.4	8.3	8.1	8.4	7.2	1.05	54	8.0	7.9	7.9	8.0	1.10	1.20	3.08	9.19	7.2c	1.055	400	1.070	10.8	108/36	3	125					2270.0 (1.5mg)		
4/26	GF,SB,GC	2040	2.72	8.5	8.4	8.5	8.5	8.4	8.3	8.1	8.2	7.9	0.98	50	7.9	7.9	7.9	7.7	1.00	0.82	2.77			1.050	400	1.075	11.6	115/40	3	120	#3 09:30	13:30			2270.0		
4/27	GF,GC			8.5	8.4	8.3	8.6	8.5	7.9	8.0	8.3	8.0	0.70	50	7.9	8.0	7.9	7.9	1.00	0.90	1.89			1.045	400	1.076	11.7	196/40	3	90	#3 04:45	13:30	12"	9"	2269.5 (1.25 mg)		
4/28	GC			8.5	8.6	8.6	8.5	8.6	8.2	8.2	8.2	8.1	0.72	51	7.9	8.0	7.9	8.0	0.80	0.80	1.95			1.043	400	1.077	11.9	198/40	3	30					2268.5 (0.75mg)		
4/29	SB			8.5	8.5	8.5	8.4	8.5	8.2	8.0	8.1	8.0	0.63	48	7.7	8.1	7.6	8.0	0.70	0.69	1.34			1.042	400	1.078	12.0	193/40	3	45					2268.5		
4/30	GF,SB	1167	2.56	8.5	8.5	8.5			7.9	7.9			0.60	53	7.9	7.9			0.70	0.80	1.32			1.045	400	1.077	11.9	100/40	3	120					2265.5		
Averages:				8.44	8.42	8.45	8.44	8.43	7.82	7.98	7.94	7.96	0.97	50	7.97	7.95	7.98	7.95	PPM	*c		9.37		1.05					109								
Notes:																																				3255	
																																				1,953,000 Gallons	
	04-01-18 past 24/hr discharge: 06:00-06:00=1440min x 1800gpm (2,592,000), - 72,000 sludge =2,520,000																																				
	04-02-18 past 24/hr discharge: 06:00-06:00=1440min x 1800gpm (2,592,000), - 72,000 sludge =2,520,000																																				
	04-02-18 10:45 KT flow decreased from 1800 gpm to approximately 800 gpm. Ph set point was increased to 8.50 from 8.40.																																				
	04-02-18 12:00 KT flow increased to approximately 1900 gpm, 14:00 KT flow decreased to approximately 1650 gpm. Operators performed manual lime feed rate and pH set point adjustments.																																				
	04-03-18 past 24/hr discharge: 06:00-06:00=1440min x 1700gpm (2,448,000), - 72,000 sludge =2,376,000																																				
	04-04-18 past 24/hr discharge: 06:00-06:00=1440min x 1650gpm (2,376,000), - 54,000 sludge =2,322,000																																				
	04-05-18 past 24/hr discharge: 06:00-06:00=1440min x 1650gpm (2,376,000), - 54,000 sludge =2,3																																				

**CENTRAL TREATMENT PLANT****MISCELLANEOUS FLOWS**

Month : Apr-18

Date	KT Flow Meter Reading
3/31/2018	0
4/30/2018	68,907,980
Total	68,907,980

Date	006 Flow Meter Reading
3/31/2018	0
4/30/2018	70,249,030
Total	70,249,030

Sweeny Pump Station Reading				
Date	#1 Pump	620 gpm	#2 Pump	500 gpm
3/31/2018	170.0	Hours	785.0	Hours
4/30/2018	170.0	Hours	785.0	Hours
Total Hours	0.0	Hours	0.0	Hours
Total Flow for 004/Sweeny For The Month =				0 Gallons

Date	Lined Storage Pond Water Level			
3/31/2018	750,000	gal	Elev. =	2268.5
4/30/2018	750,000	gal	Elev. =	2268.5

**Lined Storage Pond Influent Flows****PTM Discharge Flow**

Date	Flow (gpm)
04/05/18	15.0
04/19/18	20.0

**Old Mine Line Discharge Flow**

Date	Flow (gpm)
NA	NA



### 2017-May 03 to 2018-May 02 BHCTP LIME USAGE AFW/WOOD

Month	Silo A				Tons Added	Net Tons	Silo B				Tons Added	Net Tons	Total	
	Initial Level	Final Level	Diff. (ft)	Diff. (tons)			Initial Level	Final Level	Diff. (ft)	Diff. (tons)			Net Tons	Tons/Day
Jan 1 - Jan 31	11.70	13.30	-1.6	-8.6	72.20	63.6	16.30	16.30	0.0	0.0	0.00	0.0	63.6	2.05
Feb 1-Feb 28	13.30	15.50	-2.2	-11.9	40.50	28.6	16.30	13.80	2.5	13.5	42.10	55.6	84.2	3.01
Mar 1 - Mar 31	15.30	15.30	0.0	0.0	0.00	0.0	13.80	10.00	3.8	20.5	81.00	101.5	101.5	3.27
April 1 - April 30	15.30	15.30	0.0	0.0	0.00	0.0	10.00	14.00	-4.0	-21.6	150.70	129.1	129.1	4.30
				<b>Silo A</b>	<b>112.70</b>					<b>Silo B</b>	<b>273.80</b>		63.6	

Tdl Tons Purchased **386.50**

**Average 3.16**

#### NOTES:

08-22-17 Slaker B (Silo B) removed from service, Slake A (Silo A) placed into service - Six Month Rotation- Lime loop #2 off, Lime loop #1 on  
 Six Month Rotation - January 1, 2018 A= 11.7 B = 16.3  
 01-23-18 Lime loop #1 removed from service, lime loop #2 placed into service. #1 lime loop discharge pipe found leaking, will be replaced a:  
 01-24-18 Lime loop #1 repaired and placed into service as the primary lime slurry injection system. Lime loop #2 was also repaired.  
 02-12-18 Slaker A (Silo A) removed from service, Slake B (Silo B) placed into service - Six Month Rotation- Lime loop #1 off, Lime loop #2 on  
 Six Month Rotation - February 11, 2018 A= 15.0 B = 16.3

	Silo A	Silo B	
	15.3	14.0	FT
6.20 Tons per foot =	94.9	86.8	Tons
30% Contingency	-28.5	-26.0	FT
Working Tons	66.4	60.8	
Past 7 days usage	3.3	3.3	Tons/day
			Days of usage remaining not including 30% contingency
Days remaining	20.1	18.4	38.5

2005	Average	2.59
2006	Average	3.23
2007	Average	2.76
2008	Average	4.78
2008 EXT.	Average	3.24
2009-2010	Average	2.16
2010-2011	Average	4.31
2011-2012	Average	3.93
2012 Ext	Average	2.70
2013-2014	Average	2.40
2014/Op #1 2/11/14-8/10/14	Average	3.33
14-15/Op #2 8/11/14-2/10/15	Average	1.91
2015 Op #3 2/11/15-8/10/15	Average	2.59
15-16 Op #4 8/11/15-2/10/16	Average	1.50
2016 Op #4 ext 2/11/16-8/10/16	Average	2.49
16-17 Ext 8/11/16-1/10/17	Average	1.68
Jan - May 2 1/11/17-05-02-17	Average	0.00
2017 5-03-17-12-31-1	Average	3.86

#### Lime Daily Use - 7 Days

	Silo A				Tons Added	Net Tons	Silo B				Tons Added	Net Tons	Total	
	Initial Level	Final Level	Diff. (ft)	Diff. (tons)			Initial Level	Final Level	Diff. (ft)	Diff. (tons)			Net Tons	Tons/Day
04/24-04/30	15.30	15.30	0.0	0.0	0.00	0.0	13.60	14.00	-0.4	-2.2	38.50	36.3	36.3	5.19

#### Lime Silo A Depth Readings

Date	Prior	After	Tons Received	Tons/ft
1/8/2018	9.9	14.4	33.70	7.49
1/29/2018	8.8	13.8	38.50	7.70
2/14/2018	9.4	15.0	40.50	7.23

#### 1 Month Average:

**7.47**

#### Lime Silo B Depth Readings

Date	Prior	After	Tons Received	Tons/ft
2/26/2018	8.5	14.5	42.10	7.02
3/7/2018	9.8	16.4	42.50	6.44
3/19/2018	10.0	16.4	38.50	6.02
4/2/2018	9.0	14.2	35.20	6.77
4/11/2018	10.3	15.9	38.50	6.88
4/20/2018	10.1	15.7	38.50	6.88
4/30/2018	7.9	14.0	38.50	6.31
<b>1 Month Average:</b>				<b>6.71</b>

#### Flocculant Received

10/19/2017 2200 lbs  
 12/12/2017 4400 lbs  
 3/19/2018 4400 lbs 7/weeks  
 4/10/2018 4400lbs ordered/Est. Delivery 05-23-18

## LIME DEMAND TRACKING

Year	Month	Lime (tons)	KT flow (mg)	Lime Demand (g/L)	
2006	Jan.	70.2	56.0	0.30	
	Feb.	69.9	51.2	0.33	
	March	96.3	56.3	0.41	
	April	107.5	72.0	0.36	
	May	235.4	72.0	0.78	peak
	June	114.6	68.3	0.40	
	July	100.4	64.0	0.38	
	Aug.	118.2	64.1	0.44	
	Sept.	38.4	54.5	0.17	
	Oct.	69.5	57.6	0.29	
	Nov.	71.3	55.2	0.31	
	Dec.	78.2	60.5	0.31	
2007	Jan.	66.0	56.3	0.28	
	Feb.	51.8	50.5	0.25	
	March	81.7	65.4	0.30	
	April	127.9	66.6	0.46	
	May	154.0	63.2	0.58	peak
	June	94.1	57.9	0.39	
	July	107.0	58.3	0.44	
	Aug.	75.8	55.3	0.33	
	Sept.	77.2	50.5	0.37	
	Oct.	62.3	50.1	0.30	
	Nov.	56.9	50.8	0.27	
	Dec.	28.1	52.0	0.13	
2008	Jan.	60.7	53.4	0.27	
	Feb.	50.2	49.3	0.24	
	March	58.0	54.6	0.25	
	April	78.3	61.7	0.30	
	May	629.3	86.7	1.74	peak
	June	388.1	82.6	1.13	
	July	155.6	66.3	0.56	
	Aug.	129.5	65.2	0.48	
	Sept.	97.2	61.1	0.38	
	Oct.	76.4	58.7	0.31	
	Nov.	64.9	52.0	0.30	
	Dec.	73.0	55.7	0.31	
2009	Jan.	70.3	50.9	0.33	
	Feb.	60.3	48.2	0.30	
	March	62.1	61.7	0.24	
	April	88.0	63.1	0.33	
	May	180.9	70.2	0.62	peak
	June	146.3	64.6	0.54	
	July	104.4	61.6	0.41	
	Aug.	94.8	56.4	0.40	
	Sept.	89.2	57.0	0.38	
	Oct.	69.4	55.8	0.30	
	Nov.	70.9	55.0	0.31	
	Dec.	47.4	54.5	0.21	
2010	Jan.	66.7	55.5	0.29	
	Feb.	51.5	50.8	0.24	
	March	49.5	54.7	0.22	
	April	50.0	56.3	0.21	
	May	58.7	58.8	0.24	
	June	58.8	56.8	0.25	
	July	79.7	56.7	0.34	peak
	Aug.	54.7	56.2	0.23	
	Sept.	63.8	54.1	0.28	
	Oct.	54.6	55.4	0.24	
	Nov.	54.1	55.8	0.23	
	Dec.	64.5	54.6	0.28	
2011	Jan.	77.1	61.7	0.30	
	Feb.	69.8	54.6	0.31	
	March	94.7	61.4	0.37	
	April	119.6	65.6	0.44	
	May	433.0	84.4	1.23	peak
	June	328.4	80.0	0.98	
	July	159.9	79.3	0.48	
	Aug.	120.8	70.3	0.41	
	Sept.	92.4	60.4	0.37	
	Oct.	97.8	62.4	0.38	
	Nov.	66.8	58.4	0.27	
	Dec.	65.2	58.6	0.27	
2012	Jan.	74.9	58.4	0.31	
	Feb.	56.8	57.7	0.24	
	March	85.6	67.2	0.31	
	April	194.8	81.2	0.57	
	May	261.6	86.8	0.72	peak
	June	179.9	83.4	0.52	

## LIME DEMAND TRACKING

Year	Month	Lime (tons)	KT flow (mg)	Lime Demand (g/L)	
2012	July	140.8	74.3	0.45	
	Aug.	118.0	68.9	0.41	
	Sept.	95.6	62.2	0.37	
	Oct.	89.0	60.0	0.36	
	Nov.	73.3	57.2	0.31	
	Dec.	74.8	61.8	0.29	
	Jan.	57.2	61.9	0.22	
	Feb.	64.5	59.4	0.26	
	March	71.7	66.2	0.26	
	April	96.9	69.6	0.33	
	May	126.2	71.5	0.42	peak
	June	94.1	64.6	0.35	
2013	July	91.2	62.8	0.35	
	Aug.	89.2	58.4	0.37	
	Sept.	65.2	58.0	0.27	
	Oct.	59.3	58.3	0.24	
	Nov.	50.9	56.2	0.22	
	Dec.	49.9	56.9	0.21	
	Jan.	38.7	57.4	0.16	
	Feb.	35.8	54.6	0.16	
	March	73.1	65.3	0.27	
	April	101.1	65.6	0.37	
	May	208.3	80.6	0.62	peak
	June	127.4	65.6	0.47	
2014	July	87.5	63.4	0.33	
	Aug.	81.1	61.5	0.32	
	Sept.	63.7	56.3	0.27	
	Oct.	53.1	60.6	0.21	
	Nov.	62.8	55.0	0.27	
	Dec.	54.6	59.7	0.22	
	Jan.	51.7	58.4	0.21	
	Feb.	61.0	59.7	0.24	
	March	83.1	64.4	0.31	
	April	94.8	63.0	0.36	peak
	May	73.3	62.0	0.28	
	June	69.7	65.3	0.26	
2015	July	83.6	55.6	0.36	
	Aug.	58.4	55.3	0.25	
	Sept.	55.3	53.9	0.25	
	Oct.	56.8	52.0	0.26	
	Nov.	46.3	49.8	0.22	
	Dec.	43.7	51.5	0.20	
	Jan.	24.2	52.2	0.11	
	Feb.	33.4	53.6	0.15	
	March	66.0	64.0	0.25	
	April	86.1	63.3	0.33	
	May	96.9	58.1	0.40	peak
	June	69.9	53.1	0.32	
2016	July	68.2	56.5	0.29	
	Aug.	53.7	53.2	0.24	
	Sept.	53.6	49.8	0.26	
	Oct.	49.8	52.4	0.23	
	Nov.	48.7	53.8	0.22	
	Dec.	48.3	52.0	0.22	
	Jan.	51.7	49.3	0.25	
	Feb.	46.9	53.7	0.21	
	March	140.0	59.0	0.57	
	April	174.5	61.9	0.68	
	May	246.6	84.2	0.70	peak
	June	143.5	73.1	0.47	
2017	July	141.6	69.4	0.49	
	Aug.	87.6	58.5	0.36	
	Sept.	100.8	67.4	0.36	
	Oct.	60.8	43.5	0.34	
	Nov.	91.0	72.4	0.30	
	Dec.	76.3	67.3	0.27	
	Jan.	63.6	56.5	0.27	
	Feb.	84.2	61.0	0.33	
	March	101.5	68.9	0.35	
	April	129.1	74.1	0.42	

# KELLOGG TUNNEL ZINC DATA

		Concentration (mg/L)													
<u>Month</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
Jan.		86	81	79	63	70	61	72	57	68	41	46	50	53	53
Feb.		86	91	96	55	72	57	95	58	68	41	68	52	50	85
March		94	116	86	65	68	53	86	58	69	58	81	63	124	88
April		98	121	140	85	80	50	137	176	86	107	92	115	238	107
May		105	231	179	318	136	57	377	215	150	177	87	138	206	
June		107	182	118	271	143	68	347	164	106	131	78	108	145	
July		90	144	111	198	117	75	181	136	87	87	75	81	97	
Aug.		87	112	92	132	94	79	130	110	86	76	66	76	98	
Sept.		84	107	80	107	76	81	132	107	75	66	63	68	75	
Oct.	59	81	100	88	99	75	70	86	70	67	63	54	52	53	
Nov.	66	79	88	88	104	63	57	95	71	70	55	44	52	58	
Dec.	67	62	78	65	76	59	61	88	69	54	49	55	50	60	
<b>average</b>	<b>64</b>	<b>88</b>	<b>121</b>	<b>102</b>	<b>131</b>	<b>88</b>	<b>64</b>	<b>152</b>	<b>108</b>	<b>82</b>	<b>79</b>	<b>67</b>	<b>75</b>	<b>105</b>	
<b>lime usage (tons/day)</b>		<b>2.59</b>	<b>3.23</b>	<b>2.76</b>	<b>4.78</b>	<b>3.24</b>	<b>2.16</b>	<b>4.31</b>	<b>3.93</b>	<b>2.46</b>	<b>2.70</b>	<b>1.99</b>	<b>1.93</b>	<b>3.60</b>	
<b>Zinc Conc. Increase/Decrease</b>			<b>37%</b>	<b>-16%</b>	<b>29%</b>	<b>-33%</b>	<b>-27%</b>	<b>138%</b>	<b>-29%</b>	<b>-24%</b>	<b>-4%</b>	<b>-15%</b>	<b>12%</b>	<b>39%</b>	
<b>Lime Usage Increase/Decrease</b>			<b>25%</b>	<b>-15%</b>	<b>73%</b>	<b>-32%</b>	<b>-33%</b>	<b>100%</b>	<b>-9%</b>	<b>-37%</b>	<b>10%</b>	<b>-26%</b>	<b>-3%</b>	<b>87%</b>	

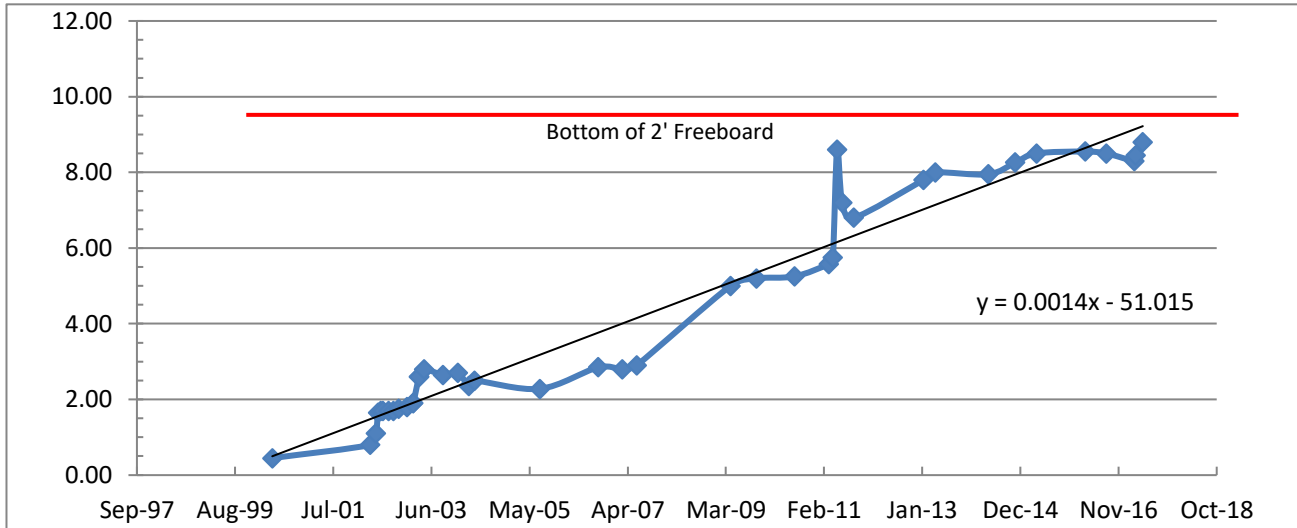
KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2000-2009										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Jan.	61,000,000	61,677,510	54,606,100	53,066,890	52,223,080	53,150,000	56,050,900	56,281,000	53,465,820	50,936,960
Feb.	57,600,000	45,584,000	52,840,000	46,493,470	48,306,920	49,860,000	51,188,000	50,511,300	49,282,209	48,146,111
March	60,730,000	57,740,360	50,452,060	60,162,290	59,852,720	58,073,000	56,332,830	65,443,650	54,578,130	61,712,540
April	68,680,000	54,846,000	65,583,230	63,335,350	50,715,310	53,775,350	72,039,280	66,636,500	61,690,530	63,055,350
May	97,719,900	57,501,901	76,082,410	63,335,350	53,245,000	54,181,650	72,027,000	63,203,308	86,680,760	70,233,580
June	69,800,000	55,835,590	67,299,960	59,532,434	50,451,170	51,750,000	68,385,600	57,981,410	82,622,590	64,623,180
July	63,698,850	53,652,330	64,820,120	66,252,746	56,538,980	55,255,000	64,054,000	58,282,900	66,324,500	61,535,000
Aug.	66,707,120	45,289,000	58,212,940	62,074,750	52,002,140	49,970,000	64,621,000	55,335,900	65,168,620	56,446,670
Sept.	55,797,530	50,276,020	60,140,460	43,789,000	49,208,020	49,987,000	54,515,270	50,471,870	61,074,020	57,006,430
Oct.	60,424,720	50,660,840	54,485,871	52,869,290	59,601,690	52,807,000	57,610,030	50,086,330	58,666,300	55,830,000
Nov.	53,408,660	50,660,840	51,072,259	47,600,000	51,948,000	50,722,600	55,191,700	50,779,040	52,041,780	54,956,800
Dec.	56,414,870	53,464,780	56,034,000	56,413,080	56,770,000	54,904,400	60,486,900	53,716,210	55,727,260	54,542,700
Totals	771,981,650	637,189,171	711,629,410	674,924,650	640,863,030	634,436,000	732,502,510	678,729,418	747,322,519	699,025,321

KELLOGG TUNNEL ANNUAL DISCHARGE FLOWS 2010-2019										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Jan.	55,503,180	61,797,170	58,434,610	61,855,400	57,478,450	58,440,540	52,196,750	49,352,650	56,555,500	
Feb.	50,819,910	54,556,227	57,763,170	59,383,290	54,607,950	59,767,470	53,694,400	53,675,440	61,451,600	
March	54,691,420	61,373,630	67,236,650	66,264,780	65,396,350	64,468,230	63,967,920	58,977,410	68,907,980	
April	56,255,340	65,687,340	81,233,630	69,619,100	65,618,770	63,056,840	63,323,620	61,947,620	74,055,850	
May	58,825,640	84,365,390	86,826,340	71,496,380	80,598,590	61,898,200	58,147,240	84,208,690		
June	56,770,200	79,985,540	83,440,990	64,663,900	65,623,330	56,368,540	53,149,810	73,144,700		
July	56,727,510	79,346,330	74,315,690	62,844,790	63,425,030	55,655,000	56,521,710	69,470,550		
Aug.	56,239,370	70,377,570	68,986,900	58,459,380	61,486,270	55,316,100	53,293,430	58,550,600		
Sept.	54,109,980	60,404,280	62,270,300	58,097,500	56,279,590	53,890,000	49,796,420	67,447,510		
Oct.	55,480,200	62,403,480	59,991,850	58,325,780	60,659,850	52,082,800	52,417,120	43,469,300		
Nov.	54,856,880	58,430,700	57,184,220	56,215,000	55,065,100	49,812,540	53,815,710	72,434,860		
Dec.	54,607,330	58,617,700	61,750,390	56,932,530	59,770,540	51,521,900	52,063,110	67,280,860		
Totals	664,886,960	797,345,357	819,434,740	744,157,830	746,009,820	682,278,160	662,387,240	759,960,190	260,970,930	0

Yellow indicates record monthly flow as well as record annual flow

### Bunker Hill Sludge Pond Sludge Staff Gauge Reading Summary

Date	Sludge Level (feet)	Estimated Sludge Elevation	Estimated Remaining Height to Road (feet)
05/19/00	0.45		
04/16/02	0.80		
05/28/02	1.10		
06/13/02	1.65		
07/01/02	1.70		
07/16/02	1.70		
08/27/02	1.70		
10/01/02	1.70		
11/06/02	1.75		
01/06/03	1.80		
02/19/03	1.90		
02/19/03	1.90		
03/31/03	2.60		
04/01/03	2.60		
05/07/03	2.80		
09/19/03	2.65		
01/01/04	2.70		
03/22/04	2.36		
04/29/04	2.50	2311	11.0
08/09/05	2.28	2310.8	11.2
09/30/06	2.85	2311.4	10.7
03/20/07	2.80	2311.3	10.7
6/30/2007	2.90	2311.4	10.6
4/30/2009	5.00	2313.5	8.50
10/31/2009	5.20	2313.7	8.30
7/31/2010	5.25	2313.8	8.25
3/31/2011	5.58	2314.1	7.92
4/30/2011	5.75	2314.3	7.75
5/30/2011	8.60	2317.1	4.90
7/5/2011	7.20	2315.7	6.30
9/26/2011	6.80	2315.3	6.70
2/4/2013	7.80	2316.3	5.70
4/30/2013	8.00	2316.5	5.50
5/12/2014	7.95	2316.5	5.55
11/20/2014	8.26	2316.8	5.24
4/20/2015	8.50	2317.0	5.00
4/1/2016	8.55	2317.1	4.95
9/1/2016	8.50	2317.0	5.00
3/20/2017	8.30	2316.8	5.20
3/28/2017	8.45	2317.0	5.05
5/18/2017	8.80	2317.3	4.70
7/31/2017	8.75	2317.3	4.75
11/15/2017	8.80	2317.3	4.70
3/1/2018	9.14	2317.6	4.36
3/27/2018	9.15	2317.7	7.35
4/9/2018	9.25	2320.8	4.25
5/1/2018	9.30	2320.8	4.20
<b>6534</b>	<b>8.80</b>	<b>Total Change, Days and Feet</b>	
Note 3	0.49	Average Rise Per Year (Includes Lined Pond Cleanout), feet	
	4.25	Estimated average remaining total height to perimeter road, feet	
	<u>2.0</u>	Assumed desired end-of-life freeboard, feet	
	2.3	Estimated available storage height, feet	
	<b>4.57</b>	<b>Estimated Remaining Life (years)</b>	
	11/4/2022		



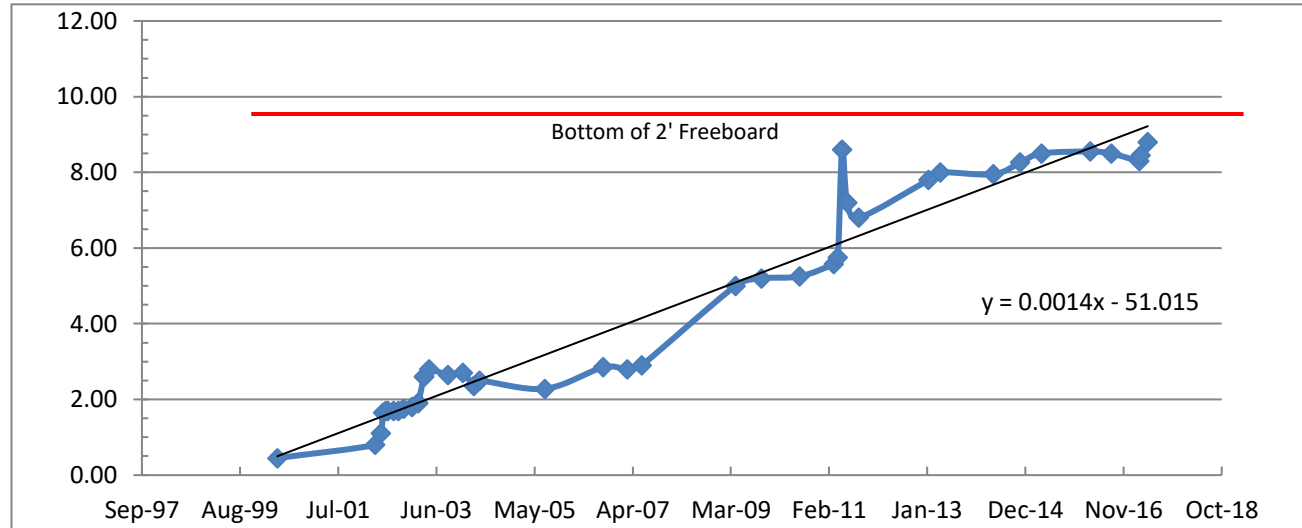
03-08-18 Polishing Pond Cleanout to CIA  
Wood Env. Elevation of 2325

**Notes:**

- 1) Pond perimeter road at SE pond corner elevation 2325.0 **4-23-18 GF Sludge Elevation 2321.1 Staff 9.25'**
  - 2) Pond area is approximately 220,000 square feet (not used in calculations)
- in Lined Pond  
precipitated in Lined Pond

### Bunker Hill Sludge Pond Sludge Staff Gauge Reading Summary

Date	Sludge Level (feet)	Estimated Sludge Elevation	Estimated Remaining Height to Road (feet)
05/19/00	0.45		
04/16/02	0.80		
05/28/02	1.10		
06/13/02	1.65		
07/01/02	1.70		
07/16/02	1.70		
08/27/02	1.70		
10/01/02	1.70		
11/06/02	1.75		
01/06/03	1.80		
02/19/03	1.90		
02/19/03	1.90		
03/31/03	2.60		
04/01/03	2.60		
05/07/03	2.80		
09/19/03	2.65		
01/01/04	2.70		
03/22/04	2.36		
04/29/04	2.50	2311	11.0
08/09/05	2.28	2310.8	11.2
09/30/06	2.85	2311.4	10.7
03/20/07	2.80	2311.3	10.7
6/30/2007	2.90	2311.4	10.6
4/30/2009	5.00	2313.5	8.50
10/31/2009	5.20	2313.7	8.30
7/31/2010	5.25	2313.8	8.25
3/31/2011	5.58	2314.1	7.92
4/30/2011	5.75	2314.3	7.75
5/30/2011	8.60	2317.1	4.90
7/5/2011	7.20	2315.7	6.30
9/26/2011	6.80	2315.3	6.70
2/4/2013	7.80	2316.3	5.70
4/30/2013	8.00	2316.5	5.50
5/12/2014	7.95	2316.5	5.55
11/20/2014	8.26	2316.8	5.24
4/20/2015	8.50	2317.0	5.00
4/1/2016	8.55	2317.1	4.95
9/1/2016	8.50	2317.0	5.00
3/20/2017	8.30	2316.8	5.20
3/28/2017	8.45	2317.0	5.05
5/18/2017	8.80	2317.3	4.70
7/31/2017	8.75	2317.3	4.75
11/15/2017	8.80	2317.3	4.70
3/1/2018	9.14	2317.6	4.36
3/27/2018	9.15	2317.7	7.35
4/9/2018	9.25	2320.8	4.25
<b>6534</b>	<b>8.80</b>	<b>Total Change, Days and Feet</b>	
Note 3	0.49	Average Rise Per Year (Includes Lined Pond Cleanout), feet	
	4.25	Estimated average remaining total height to perimeter road, feet	
	<u>2.0</u>	Assumed desired end-of-life freeboard, feet	
	2.3	Estimated available storage height, feet	
	<b>4.57</b>	<b>Estimated Remaining Life (years)</b>	
	11/4/2022		



03-08-18 Polishing Pond Cleanout to CIA

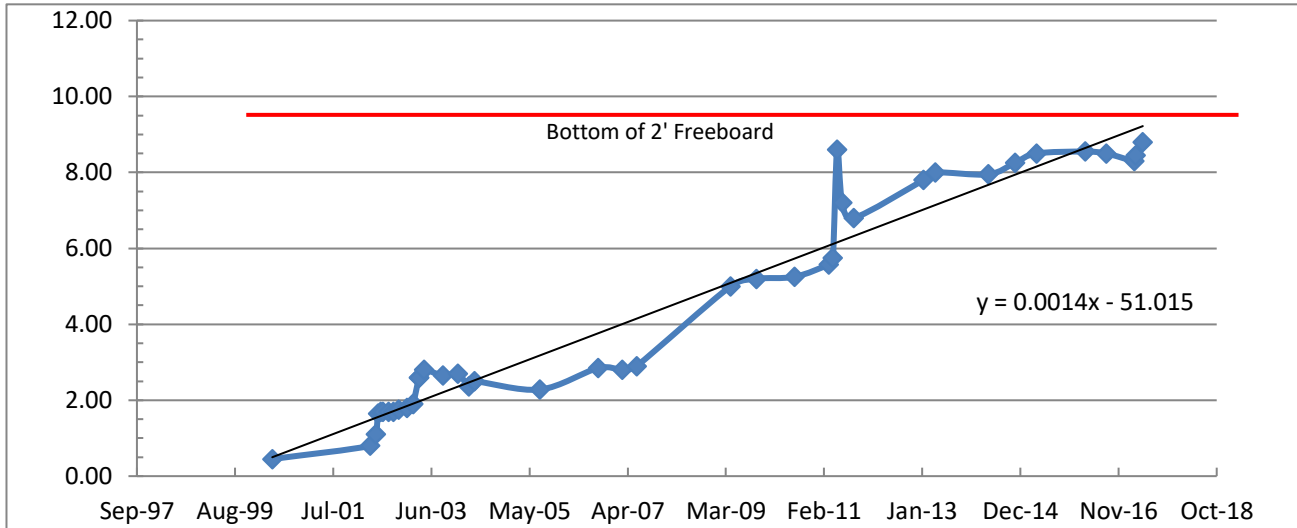
**Notes:**

- 1) Pond perimeter road at SE pond corner elevation 2325.0 **4-23-18 GF Sludge Elevation 2321.1 Staff 9.25'**
  - 2) Pond area is approximately 220,000 square feet (not used in calculations)
- in Lined Pond  
precipitated in Lined Pond



### Bunker Hill Sludge Pond Sludge Staff Gauge Reading Summary

Date	Sludge Level (feet)	Estimated Sludge Elevation	Estimated Remaining Height to Road (feet)
05/19/00	0.45		
04/16/02	0.80		
05/28/02	1.10		
06/13/02	1.65		
07/01/02	1.70		
07/16/02	1.70		
08/27/02	1.70		
10/01/02	1.70		
11/06/02	1.75		
01/06/03	1.80		
02/19/03	1.90		
02/19/03	1.90		
03/31/03	2.60		
04/01/03	2.60		
05/07/03	2.80		
09/19/03	2.65		
01/01/04	2.70		
03/22/04	2.36		
04/29/04	2.50	2311	11.0
08/09/05	2.28	2310.8	11.2
09/30/06	2.85	2311.4	10.7
03/20/07	2.80	2311.3	10.7
6/30/2007	2.90	2311.4	10.6
4/30/2009	5.00	2313.5	8.50
10/31/2009	5.20	2313.7	8.30
7/31/2010	5.25	2313.8	8.25
3/31/2011	5.58	2314.1	7.92
4/30/2011	5.75	2314.3	7.75
5/30/2011	8.60	2317.1	4.90
7/5/2011	7.20	2315.7	6.30
9/26/2011	6.80	2315.3	6.70
2/4/2013	7.80	2316.3	5.70
4/30/2013	8.00	2316.5	5.50
5/12/2014	7.95	2316.5	5.55
11/20/2014	8.26	2316.8	5.24
4/20/2015	8.50	2317.0	5.00
4/1/2016	8.55	2317.1	4.95
9/1/2016	8.50	2317.0	5.00
3/20/2017	8.30	2316.8	5.20
3/28/2017	8.45	2317.0	5.05
5/18/2017	8.80	2317.3	4.70
7/31/2017	8.75	2317.3	4.75
11/15/2017	8.80	2317.3	4.70
3/1/2018	9.14	2317.6	4.36
3/27/2018	9.15	2317.7	2.35
4/9/2018	9.25	2317.8	2.25
<b>6534</b>	<b>8.80</b>	<b>Total Change, Days and Feet</b>	
Note 3	0.49	Average Rise Per Year (Includes Lined Pond Cleanout), feet	
	2.25	Estimated average remaining total height to perimeter road, feet	
	<u>2.0</u>	Assumed desired end-of-life freeboard, feet	
	0.3	Estimated available storage height, feet	
	<b>0.51</b>	<b>Estimated Remaining Life (years)</b>	
	10/11/2018		



03-08-18 Polishing Pond Cleanout to CIA

**Notes:**

- 1) Pond perimeter road centerline elevation = 2322.0 feet from CIA as-builts Drawing C-28 **03-27-18 GF Est. Road Elevation 2320.0**
  - 2) Pond area is approximately 220,000 square feet (not used in calculations)
- in Lined Pond  
precipitated in Lined Pond



## CTP Mine Water Line Open Channel Inspection Form

**Note:** This form should be utilized weekly during the regular channel cleanout.

Results will be include with the Daily Quality Control Report and monthly DMR.

Date: April 05, 2018 Inspected By: Steve Brunner, Gary Coast

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	<u>Check for cracks</u> Ok
Channel Inlet Connection @ KT	Good / Poor	<u>Check for cracks</u> Ok
Channel Outlet/Pipeline Inlet	Good / Poor	<u>Check for cracks</u> Ok
Channel Bottom (during low flows)	Good / Poor	<u>Concrete walls show signs of pitting/corrosion</u>
Bottom Joints (during low flows)	Good / Poor	<u>Ok</u>
Trash Rack Assembly Rail Units	Good / Poor	<u>Check for corrosion and bolt tightness</u> Ok
Trash Racks	Good / Poor	<u>Wood debris was removed</u>
Parshall Flume	Good / Poor	<u>Check fiberglass and joint connections</u> Ok <u>Flume staff gauge needs replaced</u>

General Comments:

The Kellogg Tunnel flow at this time is 2.43 mgd (1690gpm), pH at this time is 2.56.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Operators removed a small amount of wood debris from the trash racks during this cleaning event.

CTP operators had no contact with any mine personnel during this cleaning event.

## CTP Mine Water Line Open Channel Inspection Form

**Note:** This form should be utilized weekly during the regular channel cleanout.

Results will be include with the Daily Quality Control Report and monthly DMR.

Date: April 12, 2018 Inspected By: Steve Brunner, Gary Coast

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks Ok
Channel Bottom (during low flows)	Good / Poor	Concrete walls show signs of pitting/corrosion
Bottom Joints (during low flows)	Good / Poor	Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	Good / Poor	Wood debris was removed
Parshall Flume	Good / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

### General Comments:

The Kellogg Tunnel flow at this time is 2.84 mgd (1972 gpm), pH at this time is 2.37.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Operators removed wood and from the trash racks during this cleaning event.

CTP operators had no contact with any mine personnel during this cleaning event.

## CTP Mine Water Line Open Channel Inspection Form

**Note:** This form should be utilized weekly during the regular channel cleanout.

Results will be include with the Daily Quality Control Report and monthly DMR.

Date: April 19, 2018 Inspected By: Gary Coast, Steve Brunner

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks Ok
Channel Bottom (during low flows)	Good / Poor	Concrete walls show signs of pitting/corrosion
Bottom Joints (during low flows)	Good / Poor	Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	Good / Poor	Wood debris was removed from both racks
Parshall Flume	Good / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

### General Comments:

The Kellogg Tunnel flow at this time is 2.84 mgd (2000 gpm), pH at this time is 2.68.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Operators removed no debris from the mine discharge trash racks during this cleaning event.

No discussions occurred with any mine personnel.

## CTP Mine Water Line Open Channel Inspection Form

**Note:** This form should be utilized weekly during the regular channel cleanout.

Results will be include with the Daily Quality Control Report and monthly DMR.

Date: April 26, 2018 Inspected By: Gary Coast, Steve Brunner

Item Inspected	Condition	Comments
Channel Sections and Joints	Good / Poor	Check for cracks Ok
Channel Inlet Connection @ KT	Good / Poor	Check for cracks Ok
Channel Outlet/Pipeline Inlet	Good / Poor	Check for cracks Ok
Channel Bottom (during low flows)	Good / Poor	Concrete walls show signs of pitting/corrosion
Bottom Joints (during low flows)	Good / Poor	Ok
Trash Rack Assembly Rail Units	Good / Poor	Check for corrosion and bolt tightness Ok
Trash Racks	Good / Poor	No debris ok
Parshall Flume	Good / Poor	Check fiberglass and joint connections Ok Flume staff gauge needs replaced

### General Comments:

The Kellogg Tunnel flow at this time is 2.95 mgd (2048 gpm), pH at this time is 2.72.

The concrete flume walls are beginning to deteriorate approximately 6" up from the flume bottom.

The submerged area of the concrete is pitting and is now approximately 1/2" indented.

Alternate hand held staff gauge was used to verify flume staff gauge and flow meter readings.

Ultrasonic flow meter calibration was correct, no adjustments were needed.

Operators removed wood debris from the trash racks during this cleaning event.

Operators replaced the ink cartridge in the KT flow meter printer.

No discussions occurred with any of the mine personnel.